

09/739750

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application:

Hiroshi TAKANASHI et al.

Serial No. 09/262,077

Filed: March 4, 1999

For: NEGATIVE-WORKING PHOTSENSITIVE RESIN COMPOSITION
AND PHOTSENSITIVE RESIN PLATE USING THE SAME

DECLARATION UNDER 37 CFR 1.132

Honorable Commissioner of Patents and Trademarks,
Washington, D. C. 20231

Sir:

I, Hiroshi TAKANASHI, a Japanese citizen, residing at 24-11, Nishirokugo 1-chome, Ota-ku, Tokyo, Japan, hereby declare and state that I am one of the inventors of the above-titled application.

I declare that I graduated from the Department of Industrial Chemistry, Faculty of Engineering at Kanto Gakuin University in Kanagawa-ken, Japan, in March 1970 and that I received Bachelor's degree in Engineering.

I also declare that I have been employed by Tokyo Ohka Kogyo Co., Ltd., the Assignee of this application, since April 1970, and that I am engaged in the research and development of photosensitive resin composition at the Specialty

Development Division.

I declare further that I have read all of the Office Actions in the above-entitled patent application, and have read and am familiar with each of the references cited in the Office Actions by the Examiner.

I declare further that the following test was conducted by myself and that the test results are true and correct to the best of my knowledge.

[Experiment]

[1] Purpose of experiment:

The purpose of the experiment is to demonstrate that unexpected results of the invention are exhibited in the claimed range of 0.001 - 0.3 wt% of component (E) of the present invention, whereas the said effects are not exhibited when component (E) is added in the amount of 6 - 15 wt%, the preferred range of mixed o,p-toluenesulfonamide, disclosed in Pine (U. S. Patent No. 4,361,640), cited by the examiner.

[2] Compounds tested:

p-toluenesulfonamide and o-toluenesulfonamide are used. Both of them correspond to component (E) having the formula (I) wherein -X represents $-SO_2NHR^2$, and are quite similar to mixed o,p-toluenesulfonamide disclosed in Pine.

[3] Test method:

By following the same procedures as EXAMPLE 1 in the present specification, except that p-toluenesulfonamide, o-toluenesulfonamide were used as component (E) instead of

steary alcohol, as well as the addition amount of component (E) was changed as indicated in Table I below, photosensitive resin compositions were prepared, and photosensitive resin plates were obtained. Using the plates, depth of non-printing areas thereof were evaluated. Details are described below.

Experiments 1 - 17:

(i) Preparation of water-soluble photosensitive resin compositions 1 - 17:

In 200 parts by weight of water was dissolved 200 parts by weight of polyvinyl alcohol (degree of saponification: 70%, degree of polymerization: 500) as component (A), and then 70 parts by weight of polyethylene glycol diacrylate as component (B), 4 parts by weight of benzyldimethyl ketal as component (C), 0.1 part by weight of methylhydroquinone as component (D), and X parts by weight (X: addition amount indicated in Table I below) of p-toluenesulfonamide were added to the solution to prepare water-soluble photosensitive resin compositions 1 - 17.

(ii) Production of photosensitive resin plates 1 - 17:

Each of the above-described water-soluble photosensitive resin compositions 1 - 17 was coated onto a polyester film (cover film), followed by drying to form a photosensitive layer of 0.7 mm in thickness. Then, a base was adhered thereto to provide photosensitive resin plates (raw plates or to-be-exposed plates) 1 - 17 each.

(iii) Evaluation of Depth of Non-printing Area:

After each of the cover film was released from the

photosensitive resin plates 1 - 17 each, the photosensitive resin plates 1 - 17 were exposed through a mask having independent fine lines of 150 μm . using a chemical lamp of 20 W from a distance of 45 mm for 10 minutes, and then, the unexposed areas were removed by washing out with water of 35°C using a brush, followed by drying at 80°C for 5 minutes to make printing plates.

The depth was evaluated by the depth (μm) of non-printing areas of independent fine lines of 150 μm of the printing plates. The results are shown in Table I and Fig. I.

Experiments 18 - 34:

By following the same procedures as Experiments 1 - 17 above, except that o-toluenesulfonamide was used instead of p-toluenesulfonamide, water-soluble photosensitive resin compositions 18 - 34 were prepared, and photosensitive resin plates 18 - 34 were obtained.

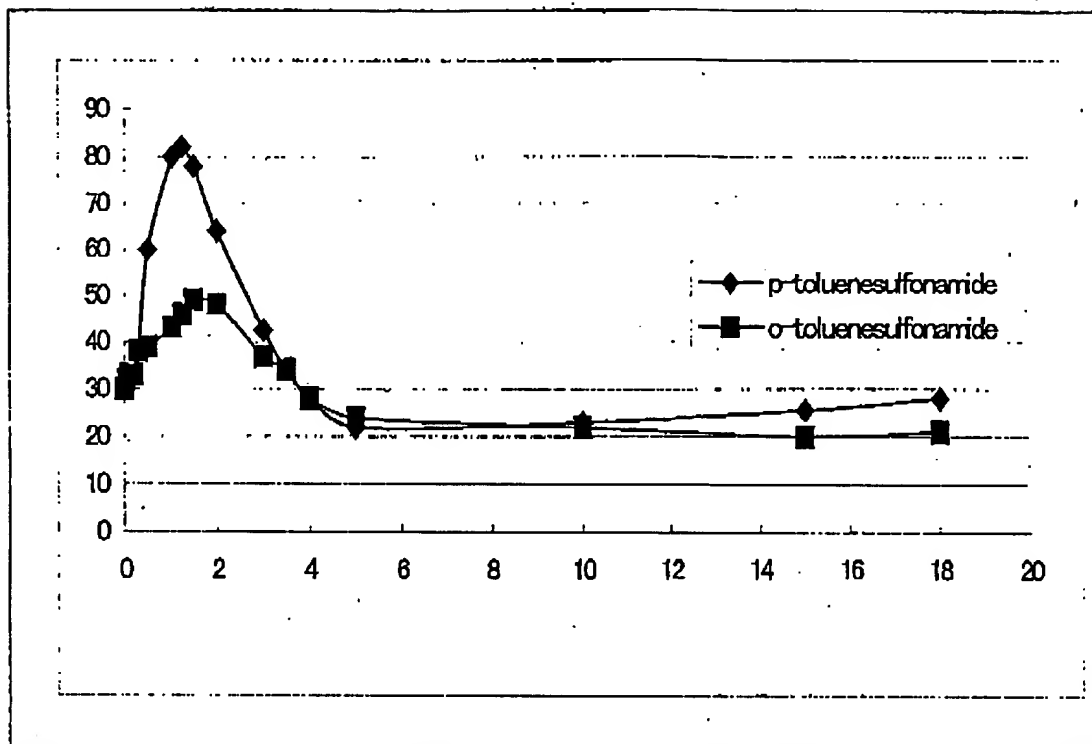
Using the plates 18 - 34, the depth was evaluated as the same manners as described in Experiments 1 - 17 above. The results are shown in Table I and Fig. I.

2 by wt.

Table I

Experiment	Component (E)	Addition Amount of component (E)	Depth (μm)	Experiment	Component (E)	Addition Amount of component (E)	Depth (μm)
Experiment 1	p-toluenesulfonamide	0	30	Experiment 18	o-toluenesulfonamide	0	30
Experiment 2	p-toluenesulfonamide	0.047	31	Experiment 19	o-toluenesulfonamide	0.047	32
Experiment 3	p-toluenesulfonamide	0.1	32	Experiment 20	o-toluenesulfonamide	0.1	33
Experiment 4	p-toluenesulfonamide	0.2	33	Experiment 21	o-toluenesulfonamide	0.2	33
Experiment 5	p-toluenesulfonamide	0.3	38	Experiment 22	o-toluenesulfonamide	0.3	38
Experiment 6	p-toluenesulfonamide	0.5	60	Experiment 23	o-toluenesulfonamide	0.5	39
Experiment 7	p-toluenesulfonamide	1.0	80	Experiment 24	o-toluenesulfonamide	1.0	43
Experiment 8	p-toluenesulfonamide	1.25	82	Experiment 25	o-toluenesulfonamide	1.25	46
Experiment 9	p-toluenesulfonamide	1.50	78	Experiment 26	o-toluenesulfonamide	1.50	49
Experiment 10	p-toluenesulfonamide	2.0	64	Experiment 27	o-toluenesulfonamide	2.0	48
Experiment 11	p-toluenesulfonamide	3.0	42.5	Experiment 28	o-toluenesulfonamide	3.0	37
Experiment 12	p-toluenesulfonamide	3.50	34	Experiment 29	o-toluenesulfonamide	3.50	34
Experiment 13	p-toluenesulfonamide	4.0	28	Experiment 30	o-toluenesulfonamide	4.0	28
Experiment 14	p-toluenesulfonamide	5.0	22	Experiment 31	o-toluenesulfonamide	5.0	24
Experiment 15	p-toluenesulfonamide	10.0	23	Experiment 32	o-toluenesulfonamide	10.0	22
Experiment 16	p-toluenesulfonamide	15.0	25.5	Experiment 33	o-toluenesulfonamide	15.0	20
Experiment 17	p-toluenesulfonamide	18.0	28	Experiment 34	o-toluenesulfonamide	18.0	21

Fig. I



[4] Results and Conclusion:

As shown in Table I and Fig. I above, it is verified that remarkable effects of the invention of deep depth of non-printing areas and excellent resolving properties were exhibited in the claimed range of 0.001 - 0.3 wt% of component (E) of the present invention, whereas the said effects could not exhibited when component (E) was added in the amount of 6 - 15 wt%, the preferred range of mixed o,p-toluenesulfonamide, disclosed in Pine (U. S. Patent No. 4,361,640), cited by the examiner.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Dated this 25 day of September , 2000

Hiroshi Takanashi

Hiroshi TAKANASHI